Amendments to the Claims:

Claims 1-43 have been amended herein. Please note that all claims currently pending and under consideration in the referenced application are shown below. Please enter these claims as amended. This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (currently amended) A method for tracking a particle through a geometric model, the ~~steps~~ method comprising:

arranging a plurality of substantially uniform volume elements into ~~said~~the geometric model;

describing a movement of ~~said~~the particle through ~~said~~the geometric model with a particle track; and

traversing ~~said~~the particle along ~~said~~the particle track from one ~~said~~ uniform volume element to another ~~said~~ uniform volume element in integer based increments.

2. (currently amended) A method according to claim 1, further comprising ~~the step of~~ converting a plurality of pixels of information contained in a medical image into ~~said~~the uniform volume elements.

3. (currently amended) A method according to claim 1, further comprising ~~the step of~~ defining a material to be associated with each ~~said~~of the uniform volume elements.

4. (currently amended) A method according to claim 3, further comprising ~~the step of~~ mapping each ~~said~~ material associated with each of the uniform volume elements to an array.

5. (currently amended) A method according to claim 1, further comprising ~~the steps of~~: determining a material of both ~~said~~ the one uniform volume element and ~~said~~ the another ~~said~~ uniform volume elements; and

terminating ~~said step of the~~ traversing ~~saidthe~~ particle when ~~saidthe~~ material of ~~saidthe~~ another ~~said~~ uniform volume element is substantially different from ~~saidthe~~ material of ~~saidthe~~ one ~~said~~ uniform volume element.

6. (currently amended) A method according to claim 5, further comprising ~~the step of~~ determining a position of intersection along ~~saidthe~~ particle track where ~~saidthe~~ material of ~~saidthe~~ one ~~said~~ uniform volume element changed into ~~saidthe~~ material of ~~saidthe~~ another ~~said~~ uniform volume element.

7. (currently amended) A method according to claim 6, further comprising ~~the step of~~ reporting ~~saidthe~~ position of intersection.

8. (currently amended) A method according to claim 1, wherein ~~saidthe~~ particle track has a primary direction of movement, further comprising ~~the step of~~ traversing ~~saidthe~~ particle along ~~saidthe~~ particle track along ~~saidthe~~ primary direction of movement.

9. (currently amended) A method according to claim 1, further comprising ~~the step of~~ setting an initial condition for ~~saidthe~~ particle track.

10. (currently amended) A method according to claim 9, wherein ~~saidthe~~ particle traverses along ~~saidthe~~ particle track beginning in a starting element of ~~saidthe~~ uniform volume elements and traverses to a next element of ~~saidthe~~ uniform volume elements, further comprising ~~the step of~~ determining a center value of ~~saidthe~~ starting element along a primary direction of movement for ~~saidthe~~ particle track, ~~saidthe~~ center value representing at least a portion of an adjusted coordinate from which ~~saidthe~~ particle will begin traversal along ~~saidthe~~ particle track.

11. (currently amended) A method according to claim 10, wherein ~~saidthe~~ particle track has at least one secondary direction of movement, further comprising ~~the step of~~ determining a

beginning coordinate value for each ~~said~~ secondary direction of movement in response to ~~saidthe step of~~

determining ~~saidthe~~ center value of ~~saidthe~~ starting element along ~~saidthe~~ primary direction of movement.

12. (currently amended) A method according to claim 1, wherein ~~saidthe~~ particle track has at least one secondary direction of movement, and further comprising ~~the step of~~ calculating an error term for each ~~said~~ secondary direction of movement, ~~saidthe~~ error terms being used to adjust a coordinate value whenever ~~saidthe~~ error term exceeds a threshold value.

13. (currently amended) A method for simulating particle transport through a geometric model, the ~~steps method~~ comprising:

arranging a plurality of substantially uniform volume elements into ~~saidthe~~ geometric model;

defining a material to be associated with each ~~said of the~~ uniform volume elements, at least one of ~~saidthe~~ uniform volume elements corresponding to a radiation source;

describing a particle track with a primary direction of movement through ~~saidthe~~ geometric model, ~~saidthe~~ particle track beginning substantially internally within ~~saidthe~~ geometric model at ~~saidthe~~ one of ~~saidthe~~ uniform volume elements corresponding to ~~saidthe~~ radiation source in a starting element of ~~saidthe~~ uniform volume elements and traversing to a next element of ~~saidthe~~ uniform volume elements; and

following a particle along ~~saidthe~~ particle track through ~~saidthe~~ geometric model until ~~saidthe~~ material of ~~saidthe~~ next element is substantially different from ~~saidthe~~ material of ~~saidthe~~ starting element.

14. (currently amended) A method according to claim 13, wherein ~~said step of the~~ describing ~~saidthe~~ particle track comprises ~~the steps of~~ defining an initial position and a vector for ~~saidthe~~ particle.

15. (currently amended) A method according to claim 13, wherein ~~said step of~~ the defining ~~said~~the material to be associated with each ~~said~~the uniform volume element further comprises ~~the step of~~ mapping each ~~said~~the material to an array.

16. (currently amended) A method according to claim 13, wherein ~~said step of~~ the following ~~said~~the particle along ~~said~~the particle track comprises ~~the step of~~ stepping along ~~said~~the particle track in integer based increments of ~~said~~the coordinate system along ~~said~~the primary direction of movement.

17. (currently amended) A method of computationally enlarging a radiation distribution for a treatment volume irradiated during radiation therapy having a radiation source substantially internal within a patient, the ~~steps~~ method comprising:

obtaining a medical image of ~~said~~the treatment volume, ~~said~~the medical image containing a plurality of pixels of information;

converting ~~said~~the pixels into a plurality of substantially uniform volume elements;

arranging ~~said~~the uniform volume elements into a geometric model;

defining a material to be associated with each ~~said~~the uniform volume element, at least one of ~~said~~the uniform volume elements corresponding to ~~said~~the radiation source;

describing a plurality of particle tracks through ~~said~~the geometric model, ~~said~~the particle tracks beginning substantially internally within ~~said~~the geometric model at ~~said~~the one of ~~said~~the uniform volume elements corresponding to ~~said~~the radiation source having a primary direction of movement beginning in a starting element of ~~said~~the uniform volume elements and traversing to a next element of ~~said~~the uniform volume elements;

simulating a particle movement along each ~~said~~ particle track of the plurality of particle tracks through ~~said~~the geometric model in integer based increments along ~~said~~the primary direction of movement until a position when ~~said~~the material of ~~said~~the next element is substantially different from ~~said~~the material of ~~said~~the starting element, ~~said~~the particle corresponding to an alpha, beta or gamma emission emanating from ~~said~~the radiation

source during ~~saidthe~~ radiation therapy, ~~saidthe~~ position corresponding to at least one of ~~saidthe~~ particles being captured, scattered and exited from ~~saidthe~~ geometric model; and computing a distribution of radiation doses based upon ~~saidthe~~ particle movement along each ~~said~~ of the particle tracks.

18. (currently amended) A method according to claim 17, further comprising ~~the step of~~ generating a plurality of axial slices of ~~saidthe~~ treatment volume.

19. (currently amended) A method according to claim 17, wherein ~~said step of the~~ converting ~~saidthe~~ pixels into ~~saidthe~~ uniform volume elements further comprises ~~the step of~~ proportionally converting a volume and shape of ~~saidthe~~ pixels into a corresponding volume and shape of ~~saidthe~~ uniform volume elements.

20. (currently amended) A computer readable medium having computer executable instructions, which when executed on a computer perform a process for tracking a movement of a particle through a geometric model, ~~the process comprising the computer executable instructions for performing the steps of~~:

arranging a plurality of substantially uniform volume elements into ~~saidthe~~ geometric model;

mapping a material associated with each ~~saidthe~~ uniform volume element to an array, at least one of ~~saidthe~~ uniform volume elements being mapped to a radiation source;

projecting ~~saidthe~~ movement of ~~saidthe~~ particle through ~~saidthe~~ geometric model with a particle track beginning in a starting element of ~~saidthe~~ uniform volume elements and traversing to a next element of ~~saidthe~~ uniform volume elements; and

traversing ~~saidthe~~ particle along ~~saidthe~~ particle track in integer based increments until ~~saidthe~~ material of ~~saidthe~~ next element is substantially different from ~~saidthe~~ material of ~~saidthe~~ starting element.

21. (currently amended) A computer readable medium according to claim 20, further

comprising ~~computer executable instructions for performing the step of~~ storing ~~said~~the array in a storage device.

22. (currently amended) A computer readable medium according to claim 20, further comprising ~~computer executable instructions for performing the step of~~ establishing a center value for ~~said~~the particle track along a primary direction of movement thereof.

23. (currently amended) A computer readable medium according to claim 20, further comprising ~~computer executable instructions for performing the step of~~ storing ~~said~~the array by integers determined from a selected coordinate system.

24. (currently amended) A computer readable medium according to claim 23, further comprising ~~computer executable instructions for performing the step of~~ computing error terms to be associated with at least one secondary direction of movement, ~~said~~the error terms being used to properly identify ~~said~~the materials stored in ~~said~~the array.

25. (currently amended) A computer readable medium according to claim 20, further comprising ~~computer executable instructions for performing the steps of~~:
reading a medical image of a treatment volume irradiated by ~~said~~the radiation source having a plurality of pixels of information contained therein; and
converting ~~said~~the pixels into ~~said~~the uniform volume elements.

26. (currently amended) A computer readable medium according to claim 25, further comprising ~~computer executable instructions for performing the step of~~ proportionally converting a volume and shape of ~~said~~the pixels into a corresponding volume and shape of ~~said~~the uniform volume elements.

27. (currently amended) A computer readable medium according to claim 25, wherein

~~said~~the medical image comprises a plurality of substantially cross-sectional slices of ~~said~~the treatment volume, further comprising ~~computer executable instructions for performing the step of~~ stacking ~~said~~the uniform volume elements into a three dimensional representation of ~~said~~the treatment volume.

28. (currently amended) A computer readable medium according to claim 20, further comprising ~~computer executable instructions for performing the step of~~ displaying ~~said~~the geometric model.

29. (currently amended) A computer readable medium having computer executable instructions, which when executed on a computer perform a process for computationally enlarging a radiation distribution of a treatment volume irradiated during a radiation therapy having a radiation source, ~~said computer executable instructions for performing the steps of~~ the process comprising:

reading a medical image of ~~said~~the treatment volume, ~~said~~the medical image containing a plurality of pixels of information;

converting ~~said~~the pixels into a plurality of substantially uniform volume elements;

mathematically arranging ~~said~~the uniform volume elements into a geometric model substantially representing ~~said~~the treatment volume;

mapping a material associated with each ~~said~~ of the uniform volume elements to an array, at least one of ~~said~~the uniform volume elements corresponding to ~~said~~the radiation source;

describing a plurality of particle tracks through ~~said~~the geometric model, ~~said~~the particle tracks beginning substantially internally within ~~said~~the geometric model in a starting element of ~~said~~the uniform volume elements and traversing to a next element of ~~said~~the uniform volume elements;

simulating a particle movement along each ~~said~~ particle track of the plurality of particle tracks through ~~said~~the geometric model in integer based increments until a position when ~~said~~the material of ~~said~~the next element is substantially different from ~~said~~the material of ~~said~~the

starting element, ~~said~~the particle corresponding to an alpha, beta or gamma emission emanating from ~~said~~the radiation source during ~~said~~the radiation therapy, ~~said~~the position corresponding to at least one of ~~said~~the particle being captured, scattered and exited from ~~said~~the geometric model; and

computing a distribution of radiation doses based upon ~~said~~the particle movement along each ~~said~~ of the particle tracks.

30. (currently amended) A computer readable medium having computer executable modules including computer executable instruction, which when executed on a computer perform a process for enlarging a radiation distribution of a treatment volume irradiated during a radiation therapy having a radiation source, the modules comprising:

a reader module for converting a plurality of pixels of information contained in a medical image into a corresponding plurality of uniform volume elements;

a modeling module for arranging ~~said~~the uniform volume elements into a geometric representation of ~~said~~the treatment volume;

a storage module for storing a material for each ~~said~~the uniform volume elements, at least one of ~~said~~the uniform volume elements being stored as corresponding to ~~said~~the radiation source;

a projection module for tracking a movement of a particle through ~~said~~the geometric representation according to integer based steps; and

a random generation module for calculating a status of ~~said~~the particle as ~~said~~the movement of ~~said~~the particle is tracked through ~~said~~the geometric representation.

31. (currently amended) A method for enlarging a radiation distribution of a treatment volume irradiated during a radiation therapy having a radiation source, the ~~steps~~ method comprising:

creating a geometric model of ~~said~~the treatment volume;

describing a movement having a primary direction thereof of a particle through ~~said~~the geometric model in integer based increments along ~~said~~the primary direction, ~~said~~the particle

representing an alpha, beta or gamma emission emanating from ~~said~~the radiation source during ~~said~~the radiation therapy; and

computing a distribution of radiation doses based upon ~~said~~the movement of ~~said~~the particle.

32. (currently amended) A method according to claim 31, wherein ~~said~~the geometric model is comprised of a plurality of substantially uniform volume elements, further comprising ~~the step of~~ defining a material to be associated with each ~~said~~the uniform volume element, at least one of ~~said~~the uniform volume elements corresponding to ~~said~~the radiation source.

33. (currently amended) A method according to claim 32, wherein ~~said~~the movement begins substantially internally within ~~said~~the geometric model in a starting element of ~~said~~the uniform volume elements and traverses to a next element of ~~said~~the uniform volume elements, further comprising ~~the step of~~ describing ~~said~~the movement of ~~said~~the particle through ~~said~~the geometric model until ~~said~~the material of ~~said~~the next element is substantially different from ~~said~~the material of ~~said~~the starting element.

34. (currently amended) A method according to claim 33, further comprising ~~the step of~~ determining a position where along ~~said~~the movement ~~said~~, the material of the next element is substantially different from ~~said~~the material of ~~said~~the starting element.

35. (currently amended) A computer readable medium having computer executable instructions, which when executed on a computer perform a process comprising the acts ~~for performing the steps~~ as recited in claim 31.

36. (currently amended) A method for simulating particle transport through a geometric model, the ~~steps~~ method comprising:

arranging a plurality of substantially uniform volume elements into ~~said~~the geometric model;

defining a material to be associated with each ~~said~~ of the uniform volume elements, at least one of

~~said~~the uniform volume elements corresponding to a radiation source;

describing a particle track with a primary direction of movement through ~~said~~the geometric model, ~~said~~the particle track beginning within ~~that~~ a surface uniform volume element first encountered by a particle from an externally-applied radiation source and proceeding therefrom as if ~~said~~the particle track were born within ~~said~~the first surface uniform volume element; and

following a particle along ~~said~~the particle track through ~~said~~the geometric model until ~~said~~the material of ~~said~~the next element is substantially different from ~~said~~the material of ~~said~~the starting element.

37. (currently amended) A method according to claim 36, wherein ~~said step of~~ the describing ~~said~~the particle track comprises ~~the steps of~~ defining an initial position and a vector for ~~said~~the particle.

38. (currently amended) A method according to claim 36, wherein ~~said step of~~ the defining ~~said~~the material to be associated with each ~~said~~the uniform volume element further comprises ~~the step of~~ mapping each ~~said~~the material to an array.

39. (currently amended) A method according to claim 36, wherein ~~said step of~~ the following ~~said~~the particle along ~~said~~the particle track comprises ~~the step of~~ stepping along ~~said~~the particle track in integer based increments of ~~said~~the coordinate system along ~~said~~the primary direction of movement.

40. (currently amended) A method of computationally enlarging a radiation distribution for a treatment volume irradiated during radiation therapy having a radiation source external to a patient, the ~~steps method~~ comprising:

obtaining a medical image of ~~said~~the treatment volume, ~~said~~the medical image containing a plurality of pixels of information;

converting ~~said~~the pixels into a plurality of substantially uniform volume elements;

arranging ~~said~~the uniform volume elements into a geometric model;

defining a material to be associated with each ~~said~~ of the uniform volume elements, at least one of ~~said~~the uniform volume elements corresponding to ~~said~~the radiation source;

describing a plurality of particle tracks through ~~said~~the geometric model, ~~said~~the plurality of particle tracks beginning within ~~that~~ a surface uniform volume element first encountered by particles from an externally-applied radiation source and proceeding therefrom as if ~~said~~the plurality of particle tracks were born within ~~said~~the first surface uniform volume element; and

simulating a particle movement along each ~~said~~ particle track of the plurality of particle tracks through ~~said~~the geometric model in integer based increments along ~~said~~the primary direction of movement until a position when ~~said~~the material of ~~said~~the next element is substantially different from ~~said~~the material of ~~said~~the starting element, ~~said~~the particle corresponding to an alpha, beta or gamma emission emanating from ~~said~~the radiation source during ~~said~~the radiation therapy, ~~said~~the position corresponding to at least one of ~~said~~the particle being captured, scattered and exited from ~~said~~the geometric model; and

computing a distribution of radiation doses based upon ~~said~~the particle movement along each ~~said~~ of the particle tracks.

41. (currently amended) A method according to claim 40, further comprising ~~the step of~~ generating a plurality of axial slices of ~~said~~the treatment volume.

42. (currently amended) A method according to claim 40, wherein ~~said step of~~ the converting ~~said~~the pixels into ~~said~~the uniform volume elements further comprises ~~the step of~~ proportionally converting a volume and shape of ~~said~~the pixels into a corresponding volume and shape of ~~said~~the uniform volume elements.

43. (currently amended) A computer readable medium having computer executable

instructions, which when executed on a computer perform a process for computationally enlarging a radiation distribution of a treatment volume irradiated during a radiation therapy having a radiation source, ~~said computer executable instructions for performing the steps of~~ the process comprising:

reading a medical image of ~~said~~the treatment volume, ~~said~~the medical image containing a plurality of pixels of information;

converting ~~said~~the pixels into a plurality of substantially uniform volume elements;

mathematically arranging ~~said~~the uniform volume elements into a geometric model substantially representing ~~said~~the treatment volume;

mapping a material associated with each ~~said~~the uniform volume element to an array, at least one of ~~said~~the uniform volume elements corresponding to ~~said~~the radiation source;

describing a plurality of particle tracks through ~~said~~the geometric model, ~~said~~the plurality of particle tracks beginning within ~~that~~ a surface uniform volume element first encountered by particles from an externally-applied radiation source and proceeding therefrom as if ~~said~~the plurality of particle tracks were born within ~~said~~the first surface uniform volume element; and

simulating a particle movement along each ~~said~~ particle track of the plurality of particle tracks through ~~said~~the geometric model in integer based increments until a position when ~~said~~the material of ~~said~~the next element is substantially different from ~~said~~the material of ~~said~~the starting element, ~~said~~the particle corresponding to an alpha, beta or gamma emission emanating from ~~said~~the radiation source during ~~said~~the radiation therapy, ~~said~~the position corresponding to at least one of ~~said~~the particle being captured, scattered and exited from ~~said~~the geometric model; and

computing a distribution of radiation doses based upon ~~said~~the particle movement along each ~~said~~ of the particle tracks.